

conditions in Central and southern Africa during the latter half of 1987 were rather peculiar and many unexpected or rare species were seen in Malawi and elsewhere. Presumably the appearance of this chat, over 1000 km south of its normal wintering grounds, can be ascribed to the weather.

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Calling by the Red-chested Cuckoo *Cuculus solitarius* in relation to rainfall

In many parts of Africa the Red-chested Cuckoo *Cuculus solitarius* is known as the 'rain-bird', as it is believed that its call announces rain or is related to rainfall. This notion is so strong that Williams (1969) thought fit to include in his species description that it "Often calls immediately before rains break and known locally as the "rain-bird"—its call being rendered as "it-will-rain"." (See also Rowan (1983) on beliefs pertaining to this and related cuckoo species in southern Africa.) During a study period of four years in East Africa the author became interested in the influence on the local ecology of rainfall and in the predictability of this important ecological variable (Prins 1988, Prins & Loth 1988).

The accurate prediction of the moment of incipient rainfall, and especially of the start of the rainy season, is of paramount importance for farmers, for example: it is a common observation that the coming of the rains, or their failure, is one of the major topics of conversation in rural communities in East Africa. Meteorologists are not very well able to predict the rains (see, e.g. Johnson 1962, Brown & Cocheme 1969, Griffiths 1972, Tyrell & Coe 1974, Fleer 1981) and here I want to address the question of whether the Red-chested Cuckoo's calling fares any better in this regard.

Methods

From December 1983 to January 1985 rainfall was checked nearly every day at Ndala Research Camp in Lake Manyara National Park, Tanzania (3°30S, 35°45E) and it was also noted whether or not the Red-chested Cuckoo called. A day with rain was defined as a day (24 h) with 0.1 mm of rain or more. Observations on rainfall and calling were made on a total of 404 d. Association between calling and absence or presence of rain on the same day was analysed through χ^2 calculations per month and for the whole period. The same type of analysis was used to investigate whether the birds called significantly more (or not) on a day preceding a day with (or without) rain; for this purpose there were 401 pairs of observations available. Yates-continuity corrections were not applied, following Everitt (1977).

Table 1. Association between calling of the Red-chested Cuckoo and rainy days

Month	Percentage of days		Association between calling and		n
	with rain	with calls	rain on the same day χ^2 value	rain on the next day χ^2 value	
Dec 1983	48	90	0.300	0.373	29
Jan 1984	38	97	0.633	0.731	29
Feb 1984	29	100	(0.000)	0.395	28
Mar 1984	23	97	0.302	0.360	31
Apr 1984	63	77	0.150	0.232	30
May 1984	11	92	3.140	0.046	25
Jun 1984	0	67	(0.000)	(0.000)	21
Jul 1984	12	0	(0.000)	(0.000)	26
Aug 1984	0	0	(0.000)	(0.000)	31
Sep 1984	3	0	(0.000)	(0.000)	30
Oct 1984	29	10	2.284	0.030	31
Nov 1984	43	87	1.885	0.192	30
Dec 1984	16	100	(0.000)	(0.000)	31
Jan 1985	23	97	0.302	0.360	31
Whole period	24.7	65.1	12.988	16.046	404
			$P < 0.001$	$P < 0.001$	

Notes: The Red-chested Cuckoo or 'rain-bird' did not call significantly more on days with rain than on days without, nor did it call significantly more on days preceding a day with rain (all monthly χ^2 values are not significant). Bracketed figures represent data sets in which there was no variation with regard to calling (i.e. the birds called every day or not at all). For the whole period there was a significant association between calling and incidence of rain but this can be explained by the near absence of calling during the dry season, which lasts in northern Tanzania from 1 June to 1 November.

Results and Discussion

In Table 1 the results are displayed: there is no indication that there was a significant association between the calling of the Red-chested Cuckoo and the presence or absence of rain on a given day if the data are analysed by month, as all monthly χ^2 figures are too low. In the same vein, there is no indication that the cuckoos called more frequently on days that were followed by rain than when the following day was dry. Calling of the 'rain-bird' did not predict the coming of rain on a short-term basis.

For the whole period there was a significant association between calling and rain on the same day, and between calling and rain on the next day (Table 1). This interaction can be explained by the total absence of calling during the major part of the dry season, as the last call was heard on 23 June 1984 and the first one again on 27 October 1984 (the dry season is defined as starting on 1 June and ending on 31 October—see Prins & Loth 1988). When only data from outside the period 23 June to 26 October are used to examine an

association between calling and rainfall, the χ^2 value is 0.710 ($n = 307$, $df = 1$, n.s.) in the case of calling and rain on the same day, and 0.005 ($n = 305$, $df = 1$, n.s.) in the case of days with rain and calling on the preceding day.

It thus can be concluded that there is neither a reason to call the Red-chested Cuckoo 'rain-bird', as its calling outside the dry season is not associated with rain, nor can its calls be used to predict the chance of rainfall the next day. Its first calling at the end of the dry season, however, appears to herald the beginning of the short rains but data would have to be collected over many years to elucidate the predictive value of its first call.

Whether the first calls are associated with the arrival of the birds from elsewhere is unclear; they were rarely seen during the rainy period and never during the dry season. The periods of calling in Africa south of the equator (see Rowan 1983, p. 312 *et seq.*) suggest a general association between calling and the rainy season. If the absence of calling means the absence of Red-chested Cuckoos in a given area, then it could be suggested that the species moves with the Intertropical Convergence Zone from south to north. However, if the birds are sedentary, as in the Nairobi, Kenya area (van Someren, cited by Rowan 1983, p. 312), calling does not reflect a migration pattern but will be associated with breeding in the best season, i.e. the rainy season.

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